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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,285	02/08/2001	William H. Gong	37,248	6593

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EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/779,285

Applicant(s)

GONG ET AL.

Examiner

Walter D. Griffin

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 12 and 14-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12 and 14-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

The rejections under 35 USC 103 as described in paper no. 11 have been withdrawn in view of the amendment filed on July 21, 2003.

New rejections follow.

### ***Claim Objections***

Claim 23 is objected to because of the following informalities: The first occurrence of the word "and" in line 3 appears to be unnecessary. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 12 and 14-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malisoff (1,971,102) in view of Hatanaka et al. (6,217,748), Gore (6,274,785), and either GB 2262942A or Webster et al. (3,163,593).

The Malisoff reference discloses a process for removing sulfur compounds from hydrocarbon oils by contacting the oil with a mixture of water, hydrogen peroxide, and organic acid such as acetic acid. Specific hydrocarbons disclosed include naphtha, gasoline, and gas oil. These hydrocarbons would necessarily have an API gravity and boil within the ranges claimed. Example 1 indicates a temperature of 90°F (32°C). After contacting, the mixture and oil separate into layers. The layers are then separated and the oil is recovered. See page 1, lines 6-32 and 49-68.

The Malisoff reference does not disclose the preliminary hydrotreating step, does not disclose the presence of nitrogen in the hydrocarbon, and does not disclose treating and recycling the separated immiscible phase. It also does not disclose treating the treated oil with a sorbent or an immiscible liquid.

The Hatanaka reference discloses a process for removing sulfur from a hydrocarbon by hydrotreating the hydrocarbon feed and then separating the hydrotreated feed into a light and heavy fraction. The hydrotreating catalyst contains Group VI (10-30 wt%) and VIII (1 to 10 wt%) metals. The light fraction scarcely contains sulfur and can be used without further

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desulfurization. The heavy fraction must be further desulfurized. The further desulfurized heavy fraction and the light fraction are mixed to form a desulfurized product. See col. 2, lines 65-67; col. 3, lines 1-11; col. 4, lines 11-48; col. 5, lines 3-7; and col. 6, lines 11-24.

The Gore reference discloses treating and recycling the oxidant. Gore also discloses treating the organic phase with a solvent such as methanol. Gore also discloses that nitrogen compounds can be removed by the oxidation treatment. See col. 4, line 47 through col. 5, line 6; col. 7, line 45 through col. 8, line 37; col. 9, lines 5-20; col. 11, line 50 through col. 12, line 22; and col. 14, lines 36-39.

The GB reference discloses the treatment of a treated oil with an alumina adsorbent. See page 16, lines 16-18.

The Webster reference discloses that either formic or acetic acid can be used along with hydrogen peroxide as an oxidizing agent in a hydrocarbon desulfurization. See col. 1, lines 15-22 and 70-72 and col. 2, lines 1-4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Malisoff by including a preliminary hydrotreating step as suggested by Hatanaka and further desulfurizing the heavy fraction of Hatanaka because only this portion of the hydrotreated feed would need to be further desulfurized by the oxidation treatment thereby reducing costs associated with the oxidation treatment. Also, substituting the oxidation treatment of Malisoff for the second hydrotreatment of Hatanaka would have been obvious to one having ordinary skill in the art because these two treatments produce an equivalent result. Therefore, substituting one for the other would produce a process that would effectively desulfurize the hydrocarbon.

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It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have treated and recycled the oxidation phase as suggested by Gore because recycling will improve the economics of the process.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized a solvent such as methanol in the process of Malisoff as suggested by Gore because a purified organic phase will be obtained.

Regarding the presence of nitrogen compounds in the feed, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a feed that contains nitrogen compounds because the presence of nitrogen compounds would not affect the removal of sulfur compounds and because the nitrogen compounds will also be removed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat the oil with a sorbent such as alumina as suggested by the GB reference because an oil with a lowered sulfur content will be obtained.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by treating the oil with an alkaline material as suggested by Webster because a material with a reduced amount of sulfur will be obtained.

### ***Response to Arguments***

The argument that the Malisoff reference does not disclose the treatment of the petroleum with an immiscible phase is not persuasive. The Malisoff reference discloses in page 1, lines 17-22, that the treating solution may be prepared with a quantity of organic acid preferably sufficient to impart at least partial oil solubility in the treating solution. The use of the word

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“preferably” indicates that the treating solution need not have at least partial oil solubility.

Therefore, the examiner maintains that the Malisoff reference discloses the use of an immiscible solution.

The argument that the claimed process produces sulfur concentrations in the treated product that a far lower than those in the product of Malisoff is not persuasive. This is not unexpected because the claimed process includes multiple sulfur removal steps whereas the Malisoff process comprises on the contacting with the treating solution.

The argument that substituting the oxidation step of Malisoff for the second HDS of Hatanaka does not produce an equivalent result is not persuasive. Both the oxidation and HDS steps result in the removal of sulfur. Therefore, the examiner maintains that one having ordinary skill in the art would expect similar results from either the HDS or oxidation steps.

The argument that the Gore reference does not disclose the removal of water from the recycled oxidant is not persuasive. Gore teaches that used oxidant is pumped into an oxidant recycler where it is treated and oxidized back up to reactive form and recycled. This indicates that the recycled oxidant is treated so that it is essentially the same as the original oxidant.

The argument concerning the GB reference is not persuasive because although it might disclose additional steps, the claims do not exclude additional steps.

The argument concerning the Webster reference is not persuasive because other advantages result from the use of lime.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is 703-305-3774. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

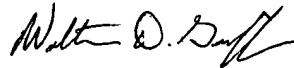


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.



Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG

September 8, 2003